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ON MARINE MOLLUSKS FROM THE PAMPEAN FORMATION.

It is known that D'Orbigny considered the pampas as a marine formation, Burmeister as a fluvio-lacustrine deposit. In a paper on the Lagoa dos patos, in 1885, I re-

ferred to conditions which I considered important for the study of such formations as the Pampean. All discussions hitherto lay great stress on the absence of marine fossils in the Pampean mud. But this fact itself seems to rest partly on the belief of Burmeister that marine organisms are not to be found in the formation.

Burmeister (Descr. Phys. Rep. Arg. II., 1876, p. 177) having seen fragments of an *Astræa* found at a depth of two meters at San Nicolas, and believing that their presence was due to some disturbance of the beds, said that it is not possible to understand how they could have reached the locality where they were found.

Burmeister's view, above cited, will be essentially modified by the announcement which I am able to make of the following list of marine shells received by me from the distinguished Argentine paleontologist, Dr. Florentino Ameghino. The specimens are from the 'formacion pampeana, piso belgranense', near La Plata.

Purpura hæmastoma L.
Nassa polygona Orb.
Bullia deformis King.
Olivancillaria auricularia Lam.
Voluta brasiliensis Sol.
Litorina flava King.
Litoridina australis Orb.
Crepidula fornicata? Lam.
Ostrea cristata Born.
Ostrea puelchana Orb.

Mytilus platensis Orb.

Mytilus exustus L (magellanicus Rve. fide Dall.).

Arca Martensii Recl.

Azara labiata Mat.

Tagelus gibbus Spgl. (platensis Orb.)

Mactra patagonica Orb.

* *Mactra Dalli* v. Iher. (M. *Byronensis* fide Dall.).

† *Mactra riograndensis* v. Thes. (M. *isabelleana* Orb. fide v. Martens).

Cytherea rostrata Koch.

An otolith of a Sciaenoid fish, *Micropogon undulatus* L., very common at Rio Grande do Sul, and probably also in the La Plata estuary.

All these mollusks are common species of the Atlantic coast of Uruguay and Argentina and most of them also from Rio Grande do Sul. Only three of them are of special interest, as not now found living in these latitudes.

Purpura hæmastoma L., still common on the coast at Rio Grande do Sul, is, I believe, not now known from the La Plata region. D'Orbigny, Petit and other authors have suggested that this species has been distributed through the agency of navigation. It is therefore important to note that it occurs fossil in America, as it does in the European Tertiary.

Litorina flava King, common from the West Indies to Santa Caterina, is not known to occur at Rio Grande do Sul.

Nassa polygona Orb. seems to have almost the same distribution as *Litorina flava*. I use D'Orbigny's name in default of the complete synonymy. Prof. von Martens considers it synonymous with *N. polygonata* Lam. Hidalgo, treating it in extenso (Moll.

del viaje al Pacifico, III., p. 39) regards it as being the same as *N. cinisculus* Reeve, with *antillarum* Dkr. and *sturnii* Phil. as varieties. So I prefer the name of D'Orbigny, as to the application of which there is no doubt.

These are, therefore, species once reaching to the 35° of south latitude, which now do not occur south of Santa Caterina or Rio Grande do Sul. It is quite possible that other species exist in the actual fauna which are dying out. For example, *Neritina meleagris* Lam., found at Santa Caterina. It occurs also in the bay of Paranagua, but only in one locality, though formerly it was much more common, being not rare in the shell mounds of the Sambaquis. Dunker (Jahrb. d. Deutsche mal. Ges. 1875, p. 245) says that *N. meleagris* is common at Montevideo, but this seems to be an error, as D'Orbigny, myself and others have not found the species in the La Plata region, either recent or fossil.

It was the opinion of Darwin, shared in part by Burmeister, that deep bays entered long distances into the interior during the Pampean formation, which for the most part is due to the action of winds and fresh water. To this I also agree. To such a gulf we owe the existence of the marine shells. The important facts discovered by Ameghino give a new turn to the discussion of the origin of the pampas.

As Dall has shown that in Florida some of the Pampean mammals occur in beds covered by marine pliocene limestone, there cannot be any doubt that the pampean formation is in part of Pliocene age. It seemed that with the important study of Santiago Roth the pampas question might be considered as settled, but the facts here considered awaken doubts. It is quite possible that observations here brought together may be increased with time and more and more tend to modify the basis of our knowledge.

* This seems to me different from the Chilian form.

† A very common species on the coast at Rio Grande do Sul, but probably undescribed. Prof. von Martens named it *M. isabelleana* Orb., but this is a species with the beaks more inflated and the valves not so thick. Descriptions will be published elsewhere.

I am not aware of the distribution of *Astræa* and other corals south to Paranagua. It is quite possible that the *Astræa*, like the mollusks above mentioned, was a denizen of warmer water, demonstrating that the temperature of the Atlantic Ocean in this region has diminished since the Tertiary epoch.

Santiago Roth says that marine (Tertiary?) shells also occur at Buenos Ayres at a considerable depth, and at other localities in the Pampean beds. The question is a difficult one, and only in the future may it be possible to fully appreciate such facts as are here put on record. The Argentine geologists have hitherto paid little attention to the study of the fossil mollusks, and for this reason this first contribution of Ameghino is encouraging and important.

H. VON IHERING.

MUSEO PAULISTA, SAN PAULO, BRAZIL.

USE OF THE INITIAL CAPITAL IN SPECIFIC NAMES OF PLANTS.

THE idea seems to prevail among some naturalists, as may be seen from a recent review in this journal (p. 162), that the retention of the initial capital in certain specific names of plants is a barbarous relic that the botanists themselves cannot honestly defend. As a matter of fact, this is very far from the truth, for it is almost universally adopted in botany, and for good and logical reasons. In the latest authoritative enumeration of American plants, namely, the *List of Pteridophyta and Spermatophyta*, there are four classes of specific names that are written with an initial capital: (1) Species named in honor of persons; (2) species named from places; (3) names of old genera, tribes or sections used as specific names; (4) substantives used as specific names.

The first case is based largely on sentiment. It, to the botanist, does not look well or dignified to write a person's name with a lower case initial. The name was given as an honor or monument to the per-

son, and should be maintained as such. Not *Sedum torreyi*, *Plantago purshii*, but *S. Torreyi* and *P. Purshii*.

The second case is, perhaps, least defensible of all, yet it seems most natural and logical to give the name of a place as nearly as it is usually written, at least in English speaking countries. Thus, *Sambucus Canadensis* and *Campanula Americana*, rather than *S. canadensis* or *C. americana*.

The third case, namely the capitalization of specific names derived from old genera, tribes or sections, is in the highest degree valuable and conducive to accuracy. As names derived from these sources do not necessarily agree in case and number with the generic word, the initial capital calls attention to this, saves much trouble, and reduces the probability of error. *Campanula Medium*, for example, would half the time be changed into *Campanula Media*, but for the initial. So also with *Convolvulus Sepium*, *Achillea Millefolium*, *Delphinium Consolida*, *Vaccinium Oxycoccus*, and hundreds of others that could be mentioned.

The ease with which words of this kind are changed is very well shown by the spelling of the name of the ruffed-grouse in the *Century Dictionary*. The correct name is *Bonasa Umbellus* and it is so printed in most places, but under the vocabulary word *Bonasa* it is *B. umbella*. This is, of course, quite a different thing, and simply shows that some unguided proof-reader, observing that the termination *us* did not agree with *Bonasa*, changed it.

The fourth case is much the same as the one just considered. Substantives do not necessarily agree with the generic word, and it is a matter of much convenience and information to write them with an initial capital, *e. g.*, *Ilex Dahoon*, *Gaultheria Shallon*. In this form they stand out in bold relief, while if the lower case was used there would be the constant tendency to make them harmonize in termination with the genus word.